

AMENDMENTS TO THE SPECIFICATION

Please replace original paragraphs 4 and 5 with the following amended paragraphs:

[0004] According to an example of the present invention, is a plate pair for use in a heat exchanger including comprises a first plate having a first opening through a first plate portion thereof, a second plate having a second opening through a second plate portion thereof, the second opening being larger than the first opening, and braze material securing the first plate portion to the second plate portion with the first and second openings in substantial alignment with each other[.] and together forming a fastener opening capable of receiving a fastener for mounting purposes.

[0005] According to another example of the invention, is a method of forming a plate pair for use in a heat exchanger, including includes: (a) providing a first plate having a substantially planar central portion surrounded by a first peripheral edge portion, the first peripheral edge portion including a substantially planar peripheral flange section having a first opening formed therein through a substantially planar portion thereof; (b) providing a second plate having a second peripheral edge portion having a second opening through said second edge portion a substantially planar portion thereof, one of the first and the second opening openings being larger than the other of the first and second opening openings, at least one of the first plate and second plate being covered with a brazing material; and (c) oven brazing the first plate and the second plate together with the first plate peripheral flange section planar portion abutting against the second peripheral edge plate planar portion and the first and second openings substantially in alignment with each other[.] , the substantially aligned first and second openings together forming a mounting opening for receiving a fastener for mounting the heat exchanger.

Please replace original paragraphs 35 and 36 with the following amended paragraphs:

[0035] Referring again to the embodiment of Figure 1, as described above, the cover plate 18 of such embodiment includes a connecting flange 26 that abuts against and is secured to

an edge portion 27 of the base plate 14. The connecting flange 26 and edge portion 27 collectively provide a mounting flange for mounting the heat exchanger to the chassis of a vehicle, and in an example embodiment, a series of annular openings or holes [[40]] 41 and [[42]] 43 are provided through the connecting flange 26 and edge portion 27, respectively. The openings [[40]] 41 and [[42]] 43 may be punched or otherwise formed through the connecting flange 26, and edge portion 27, respectively. When the heat exchanger 10 is assembled, each opening [[40]] 41 through the connecting flange 26 is aligned with a corresponding opening [[42]] 43 through the edge portion 27, as best seen in Figure 5. Each pair of aligned openings [[40]] 41, [[42]] 43 provides an opening through the mounting flange of the heat exchanger 10 suitable for receiving a mounting fastener such as a rivet or bolt so that the heat exchanger can be secured to a vehicle chassis. For example, Figure 13 is a partial sectional view showing a not yet compressed rivet 46 passing through an aligned pair of cover and base plate openings [[42, 40]] 43, 41 and through a further opening provided in a vehicle chassis 48. As seen in Figures 5 and 13, the opening [[40]] 41 through the cover plate connecting flange 26 is smaller than the opening [[42]] 43 through the base plate edge portion 27. In one example embodiment, both of the openings [[40]] 41 and [[42]] 43 are circular, with the opening [[40]] 41 having a smaller diameter than the opening [[42]] 43. However, other shaped holes can be used in other example embodiments – for example, as shown in Figures 14A – 14D one or both of the openings could be oval (Figure 14A), elliptical (Figure 14B), triangular (Figure 14C) or rectangular (Figure 14D), or square, or star shaped, or other multi-sided shape, among other shapes, so long as one of the openings [[40, 42]] 41, 43 in each aligned pair is larger than the other. When aligned, the openings of a pair may not be in exact concentric alignment, however in an example embodiment, the perimeter or circumference of the smaller opening does not overlap the perimeter of the larger opening. Thus, the effective diameter or size of the resulting opening formed by the aligned pair of openings is substantially equal to that of the smaller opening [[40]] 41. In some embodiments, the cover plate opening [[40]] 41 may be larger rather than smaller than the base plate opening [[42]] 43 for all or some of the aligned pairs. In some embodiments, the smaller and larger openings in a pair could have different shapes, for example a small circular opening used in combination with a larger elliptical opening, or, as ~~shwon~~ shown in Figure 14C, a triangle shaped opening [[40]] 41 used in combination with a square shaped

opening [[42]] 43. In some example embodiments where circular openings are used for receiving a mounting rivet or bolt, the smaller opening has a diameter of between 5 and 6 mm and the larger opening has a diameter that is between 7 and 8 mm, although it will be understood that such dimensions and percentages are provided as non-limiting examples only as opening size will be affected by, among other things, plate thickness and the desired use of the aligned openings. In one example embodiment the difference in opening sizes is selected so that if the smaller opening and large opening are in concentric alignment, the minimum distance between the edge of the larger opening and the edge of the smaller opening will be at least equal to the thickness of the plate with the larger opening.

[0036] The use of different sized aligned openings [[40, 42]] 41, 43 provides an improved degree of manufacturing tolerance than would be provided by openings having a common size, especially when braze-clad (or braze-filler metal coated) plates 14 and 18 are used to make the heat exchanger 10. For example, even if the openings [[40, 42]] 41, 43 of a pair are slightly misaligned, as long as the misalignment does not exceed the amount by which the larger hole exceeds the size of the smaller hole, the resulting mounting hole formed by the aligned pair will still have the same effective diameter (ie. that of the smaller opening). Additionally, as shown in Figure 5, the brazing process often results in the formation of fillets 44 of cladding material. In aligned holes of the same size, the fillet material can partially block the resulting mounting hole. However, as can be seen in Figure 5, when openings of different sizes are used, the larger circumference of the larger opening [[42]] 43 draws the fillet or clad material back from the area of the smaller opening [[40]] 41 such that the fillet 44 does not obstruct the smaller opening [[40]] 41. Thus, the use of aligned openings of different sizes allows the final mounting hole size to be controlled with a greater degree of predictability and with looser manufacturing tolerance than would be required if openings of the same size through adjacent plates were aligned together. Thus, the use of different sized openings addresses the problem of trying to fit a pin-like device through a hole, where the hole is made from a lap joint of 2 or more layers, and where the pin has a close outer diameter to that of the nominal hole inside diameter. During brazing of a conventional lap joint containing identical holes, the hole edges provide a capillary drawing force on the molten ~~filler~~ filler metal, tending to draw the filler metal into the hole. Not

only does the ~~filler~~ filler metal partially block the hole, but its location within the hole is unpredictable, and thus difficult to compensate for by conventional means. Also, when the holes are identical in size and they are slightly misaligned, this actually compounds the problem by increasing the capillary effects involved. The use of different sized holes in a lap joint helps to alleviate such problems.

Please replace original paragraph 41 with the following amended paragraph:

[0041] With reference to the three-pass heat exchanger 110 of Figure 16, the turbulizer plate 16 includes two internal barriers 62 and 62A formed by crimped lines of convolutions in the turbulizer plate. Barrier 62 extends from substantially the first end 60 of the fluid chamber 24 to termination locations 36 which is spaced apart from the second end 70. Barrier 62A extends from substantially the second end 70 of the fluid chamber 24 to a termination location 36A spaced apart from the first end 60. The two barriers 62 and 62A divide the heat exchanger fluid chamber 24 into three side-by-side connected flow regions through which fluid flows back and forth in the direction indicated by arrows 74. In order to reduce flow restriction at the regions in the flow chamber 24 at which fluid must pass around a bend, V-shaped notches 80 and [[80A]] 80B are provided in the end areas of turbulizer plate 16 at the regions where the fluid is forced to turn around the barriers 62 and 62A, respectively. Although no shown in Figures 15 and 16, barrier or baffle blocks 52 could be used at the sealing ends of each of the baffles 62, 62A and 62B to reduce the chance of short circuiting at such ends.